

3

MAR-14-03 03:51PM FROM-Fengwick & West

416 281 1230

T-581 P.018/054 F-852

(5)

特藏平7-312494

1.20	轴流型ファン	2.21	ファン
ケース			
3.22	モータ	4	回転体
5.30	ホモ	31	ピン
32	往復ピン	49	内回転体

41 カム溝	41A 始端
41B 終端	50 外回転体
51 スリット	55 傷受
90 プリント板吸容シェルフ	81 プリント板

11

〔圖2〕

本発明の実施例の斜視図

太発明の実施例の断面図

00...内包实体
50...外包实体
E1...カル弄
51...エリート
51...ピン
52...自動ピン
55...郵便

104

本卷明の実施割の金子義勝の回顧

【圖 6】

佐末のファンシェルフの規格

This diagram illustrates the exploded view of a shelving unit. The main frame (1) is shown with its side panels (2) and shelves (3). A separate assembly (4) is shown, which includes a side panel (5) and a base (6). The number '10' is written above the main frame, indicating its weight.

3

MAR-14-03 03:51PM FROM Fenwick & West

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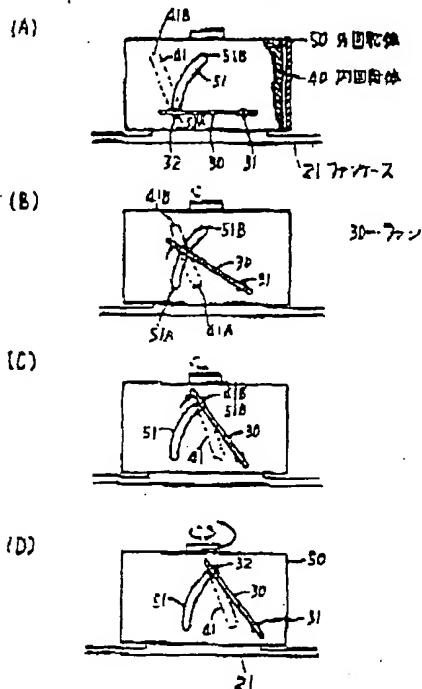
T-851 P.014/034 F-852

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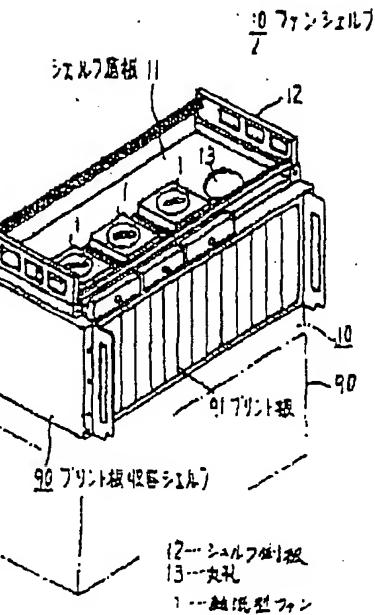
【図3】

本発明の軸流型ファンの作用を説明する図



【図5】

電子機器の断面図



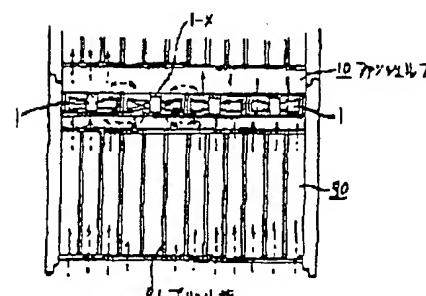
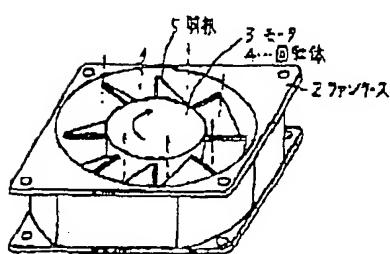
【図7】

従来の軸流型ファンの断面図

【図8】

従来の電子機器の断面図

1 軸流型ファン



90-プリント板収容シェル
1-軸支空ファン
1-X-板厚さ(軸支空ファン)

(3)

PATENT ABSTRACTS OF JAPAN

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(51)Int.Cl.

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F04D 25/08
F25D 1/00
H01L 23/467

(21)Application number : 06-105087

(71)Applicant : FUJITSU LTD

(22)Date of filing : 19.05.1994

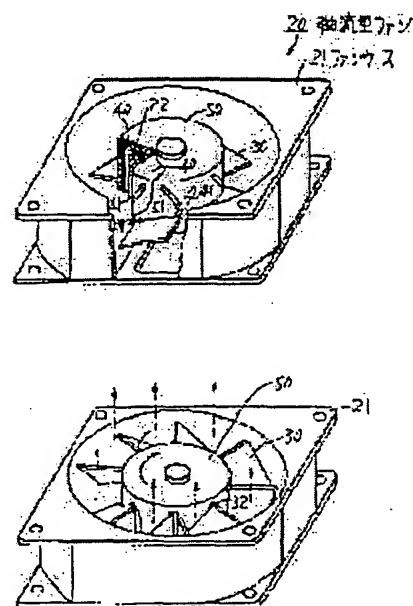
(72)Inventor : NAKAGAWA RYOICHI
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KANAMARU YASUHISA

(54) AXIAL FAN AND COOLING STRUCTURE OF ELECTRONIC APPARATUS

(57)Abstract:

PURPOSE: To provide an axial fan in which counterflow of air and intrusion of dust can be blocked during stoppage and to provide a cooling structure for electronic apparatus in which temperature rise of internal components can be suppressed upon failure.

CONSTITUTION: The cooling structure for electronic apparatus comprises a motor 22 disposed in the axial center of a fan case 21, an inner rotor 40 rotated through the motor 22, a plurality of arcuate cam grooves 41 made at the tubular part of the inner rotor 40, an outer rotor 50 fitted rotatably over the inner rotor 40, and a plurality of blades 30 fixed to the outer periphery of the outer rotor 50 such that a driven pin 32 projecting from the vicinity of the fringe of side end face is fitted slidingly in the cam groove 41 and a pin 31 projecting from the vicinity of the root of side end face is pivoted at the lower part of the outer rotor 50.



LEGAL STATUS

[Date of request for examination]

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[Number of appeal against examiner's decision of rejection]

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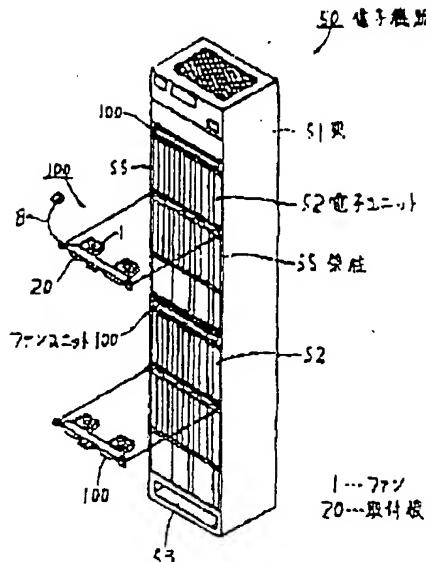
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特明华B-172287

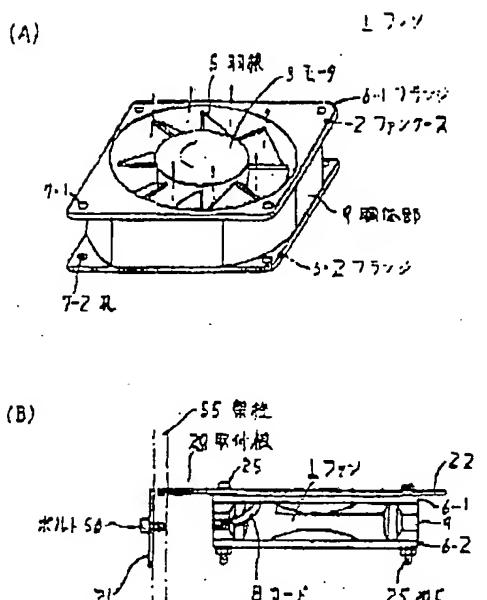
[403]

電子機器の制御回路



〔圖八〕

先 例 の 図



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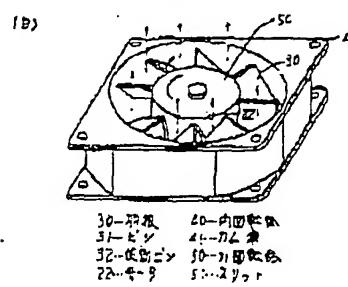
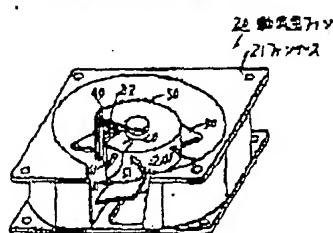
(54) (発明の名称) 駆走型ファン及びそれを用いた電子機器の冷却構造

(57) (五)

【目的】排気装置等に用いる軸流型ファン及び軸流型ファンを用いた電子機器の冷却装置に關し、停止中の空気の逆流の阻止及び歯突等の侵入の阻止される軸流型ファン、あるいは改良した場合に機器内に収容した部品の温度上昇が抑制される電子機器の冷却構造を提供する。

〔構成〕 ファンケース21の軸心部のモータ22と、モータ22により回転される内回転体40と、内回転体40の周部に配設されてなる円筒状の複数のカム部41と、内回転体40の外側に回転運動自在に嵌合されてなる外回転体50と、側端面の先端附近に形成した從動ピン32がカム部41内に嵌合自在に嵌合し、側端面の桿先附近傍に形成したピン31が外回転体50の下部に嵌合されてピン31を支点にして摆動運動自在に、外回転体50の外周側に嵌合されてなる嵌合の羽根30とを備えるものとする。

本分明の突起物の軽根図



PATENT ABSTRACTS OF JAPAN

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KUMAHARA KAZUO
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MINOWA YOSHIAKI

(54) FAN UNIT

(57) Abstract:

PURPOSE: To obtain a fan unit by which the height of an electronic apparatus can be reduced by a method wherein a band metal fitting which carries and holds a trunk part between the upper flange and the lower flange of a fan module and which comprises seat parts at the right end part and the left end part on the side of an opening is fixed and bonded to the rear of a vertical plate for a channel-shaped member.

CONSTITUTION: A band metal fitting 40 is formed so as to be bent to be nearly a U-shape as viewed from a plane in such a way that it carries and holds a trunk part 9 between the upper flange 6-1 and the lower flange 6-2 of a fan module 1, and the right end part and the left end part on the side of an operating are bent respectively perpendicularly to the outside so as to form seat parts 41. The band metal fitting 40 is coupled so as to carry and hold the trunk part 9 for the fan module 1, the seat parts 41 are brought close to the rear of a vertical plate for a channel-shaped member 32, and the fan module 1 is mounted on a mounting plate 30. At this time, the width of the band metal fitting 40 which carries and holds the trunk part 9 for a fan case 2 is made smaller than the height of the fan case 2, and also the height of the channel-shaped member 30 is nearly equal to the width of the band metal fitting 40.

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[the examiner's decision of rejection or
application converted registration]

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3. In the drawings, any words are not translated.

CLAIMS

[Claim(s)]

[Claim 1] The fan unit which is characterized by providing the following and which carries out insertion wearing between the electronic units carried in the rack multi-stage, and cools this electronic unit. The fan module which consists of a wing carried free [a rotation drive] in the fan case where it has a flange in the end face of a top and the bottom, and this fan case. it can insert between the bridging board member which constructs across the front face of this rack and fixes an edge on either side to **** of the both sides of this rack, respectively, and an electronic unit -- as -- a bridging board -- the tie-down plate which ***** formed or connected with the rear-face side of a member becomes from the channel form member of the typeface of U The plane view formed so that the fuselage section between this fan module top and a bottom flange might be supported from under is the taking-a-seat section mostly to the edge of the right and left by the side of opening by the typeface of KO.

[Claim 2] The fan unit characterized by having been intervened and equipped with the elastic body board between the fuselage section of the aforementioned fan module, and the aforementioned band metallic ornaments, and being intervened and equipped with other elastic body boards between this fuselage section and the channel form member of the aforementioned tie-down plate.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] this invention relates to the fan unit which cools the electronic unit carried in the rack multi-stage.

[0002] Electronic equipment, such as a communication device, is shown in drawing 3. In drawing, 50 is electronic equipment which carried the electronic unit 52 in the rack 51 multi-stage. To each of the side plate of right and left of ***** and a case, it is what held much printed circuit boards in parallel with a case, and the flat-surface configuration attached the fixing member of an angle type, and the electronic unit 52 contacted the field by the side of the transverse plane of **** 55 of a right-and-left couple, and has fixed this fixing member at the rack 51 using a bolt.

[0003] In addition, the ventilating hole is arranged in each of the hypopleura of a case, and a top board. The above-mentioned electronic equipment 50 is making small depth of the electronic unit 52 carried in a rack 51, and is attaining the miniaturization.

[0004] 100 It is the fan unit which attached ** and two or more fan modules 1 in parallel with a tie-down plate 20. It is the fan unit 100 by leveling the fan module 1 so that the ventilation direction of a fan module may point to the vertical direction, inserting a fan module side in the rack 51 of the lower part of the electronic unit 52, contacting the field by the side of the transverse plane of **** 55 of a right-and-left couple, and attaching the edge of right and left of the perpendicular Itabe material of a tie-down plate 20 in a rack 51 using a bolt. It is carried in a rack 51.

[0005] On the other hand, the inhalation mouth 53 is formed in the front-face side of the bottom of a rack 51. The electronic equipment 50 constituted as mentioned above is the fan unit 100. If the fan module 1 is driven, respectively, the open air will be inhaled from the inhalation mouth 53, it will ventilate up, and air will be sent into the electronic unit 52.

[0006] The air ventilated in the electronic unit 52 passes along between each printed circuit board, it goes up, taking heat, and is discharged from the crown plate of a rack 51.

[0007]

[Description of the Prior Art] The conventional fan unit is explained referring to drawing 4. drawing 4 - - setting -- the axial flow type fan module 1 -- the center of the fan case 2 -- it consists of a motor 3 installed in the axial center of a hole, body of revolution of the closed-end cylindrical shape which separates and attaches a gap in the outside of a motor 3, and two or more wings 5 arranged in pitches [side / periphery / of body of revolution]

[0008] Therefore, if a motor 3 is driven, body of revolution will rotate, a wing 5 rotates in connection with it, and from the lower part of the fan module 1, air is inhaled and it discharges up. The fan case 2 is the upper flange 6-1 of the square shape which four angles were beveled and was formed in the fuselage section 9 and the upper part of the fuselage section 9. It consists of a lower flange 6-2 of the square shape formed in the lower part of the fuselage section 9.

[0009] Upper flange 6-1 Hole 7-1 which inserts the cervix of a screw thread 25 in four corners, respectively It has arranged. Moreover, lower flange 6-2 It is the upper flange 6-1 to four corners. Hole

7-1 It is a hole 7-2 face to face. It has prepared.

[0010] 20 is a tie-down plate which bent the metal plate to side **** L form and which consists of perpendicular Itabe material 21 and level Itabe material 22. The perpendicular Itabe material 21 is a member which contacts and fixes an edge on either side using a bolt 56 to the field by the side of the transverse plane of **** 55 of the right-and-left couple of a rack.

[0011] a horizontal plate -- a member 22 is equal to a predetermined part to attach the fan module 1 in in the bore size of the fuselage section 9 -- circular -- a hole -- having -- this -- circular -- the periphery section of a hole -- upper flange 6-1 Hole 7-1 Hole (four holes) which corresponds, ****s and inserts the cervix of 25 It has arranged.

[0012] Upper flange 6-1 Alignment of the upper surface is carried out to the undersurface of the level Itabe material 22, it contacts, and **** of a screw thread 25 is the hole of the level Itabe material 22. Top flange 6-1 A hole 7-1 and lower flange 6-2 So that a hole 7-2 may be penetrated A screw thread 25 is inserted and it is the lower flange 6-2. By screwing a nut on the thread part which projected from the undersurface, the fan module 1 is hung to the tie-down plate 20.

[0013] The fan module 1 is carried in a tie-down plate 20 as mentioned above, and the conventional fan unit is constituted.

[0014]

[Problem(s) to be Solved by the Invention] A fan unit levels a fan module so that the ventilation direction of a fan module may point to the vertical direction as mentioned above, it is inserted between electronic units, and is carried in electronic equipment.

[0015] by the way, the conventional fan unit -- the horizontal plate of a tie-down plate -- the inferior surface of tongue of a member -- the upper surface of the upper flange of a fan module -- contacting -- a horizontal plate -- the upper part of a member to a screw thread -- a horizontal plate -- the hole of a member and the hole of a top and a bottom flange were made to penetrate, the nut was screwed on the thread part of the screw thread which projected from the inferior surface of tongue of a lower flange, and the fan module is hung to the tie-down plate

[0016] That is, for the conventional fan unit, height is a screw head. Only the board thickness and thickness of nut of level Itabe material are larger than the thickness of a fan module. For this reason, it was required that a fan module thick twist should also have been large enough, and the interval of the upper and lower sides of the electronic unit carried in a rack should have been taken, consequently the height of electronic equipment became large, and there was a trouble of checking the miniaturization of electronic equipment.

[0017] this invention was created in view of such a point, and aims at offering the fan unit of the thin shape which can make height of electronic equipment small.

[0018]

[Means for Solving the Problem] It is the fan unit which carries out insertion wearing of this invention between the electronic units carried in the rack multi-stage as illustrated to drawing 1, and cools an electronic unit in order to attain the above-mentioned purpose, and is a flange 6-1 and 6-2 to the end face of a top and the bottom. It has the fan module 1 which consists of a fan case 2 which it has, and a wing 5 held free [a rotation drive] in the fan case 2.

[0019] a bridging board with the up-and-down width of face almost equal to the thickness of the fan module 1 which constructs across the front face of a rack and fixes to **** of right and left of an edge on either side, respectively -- it can insert between a member 31 and an electronic unit -- as -- a bridging board -- ***** formed or connected with the rear-face side of a member 31 is equipped with the tie-down plate 30 which consists of a channel form member 32 of the typeface of U

[0020] Furthermore, the fan module 1, a top and a bottom flange 6-1, and 6-2 The plane view which supports the fuselage section 9 of a between from under equips the edge of right and left by the side of opening with the band metallic ornaments 40 which have the taking-a-seat section by the typeface of KO mostly.

[0021] These band metallic ornaments 40 are fixing the taking-a-seat section 41 in contact with the rear face of the perpendicular board of the channel form member 32, and are considered as the composition

which is what carries the fan module 1 in a tie-down plate 30.

[0022] Moreover, it considers as the composition with which the elastic body board 46 of others [board / elastic body / 45 / between / the fuselage section 9 and the channel sections 32 of a tie-down plate 30] intervened, respectively, and it was equipped between the fuselage section 9 of the fan module 1, and the band metallic ornaments 40.

[0023]

[Function] The width of face of the band metallic ornaments which support the fuselage section of a fan case from under is smaller than the height of a fan case, and its height of the channel form member of the tie-down plate which fixes band metallic ornaments is also almost equal to the width of face of band metallic ornaments.

[0024] Therefore, the fan unit of the thin shape which a fan module thick twist can also enlarge slightly the interval of the upper and lower sides of the electronic unit carried in a rack, and can make height of electronic equipment small is offered.

[0025] On the other hand, according to invention of a claim 2, the elastic body board intervenes, respectively between the fuselage section of a fan module, and band metallic ornaments, and between the fuselage section and the channel section of a tie-down plate.

[0026] Therefore, since vibration of the fan module resulting from rotation of a wing is absorbed with an elastic body board, generating of noise can be prevented. Moreover, the adhesion of a fan module and band metallic ornaments is secured by having made the elastic body board intervene.

[0027]

[Example] this invention is explained concretely, referring to a view below. In addition, the same sign shows the same object through a complete diagram.

[0028] Drawing 1 is drawing of the example of this invention. (A) is a perspective diagram shown in the separated form. (B) is a perspective diagram after combination and drawing 2 is drawing of other examples of this invention. (A) is a perspective diagram. (B) is a cross section.

[0029] drawing -- setting -- 100 It is the fan unit which insertion wearing is carried out between the electronic units carried in the rack multi-stage, and cools an electronic unit. Fan unit 100 It is the composition which combined the band metallic ornaments 40 which support the fan module 1 from under, and the tie-down plate 30 which fixes to **** 55, and fixed.

[0030] fan unit 100 the axial flow type fan module 1 to carry -- the center of the fan case 2 -- it consists of a motor 3 installed in the axial center of a hole, body of revolution of the closed-end cylindrical shape which separates and attaches a gap in the outside of a motor 3, and two or more wings 5 arranged in pitches [side / periphery / of body of revolution]

[0031] The fan case 2 is the upper flange 6-1 of the square shape which four angles were beveled and was formed in the fuselage section 9 and the upper part of the fuselage section 9. It consists of a lower flange 6-2 of the square shape formed in the lower part of the fuselage section 9.

[0032] the bridging board which constructs across the front face of a rack the tie-down plate 30 which consists of metal plates, such as steel, contacts an edge on either side in the field by the side of the transverse plane of **** 55 on either side, and fixes using a bolt 56 -- a member 31 and a bridging board -- it consists of channel form members 32 which come to bend the center section of the top edge of a member 31 to the typeface of U by ***** back

[0033] Height of the bridging Itabe material 31 and the channel form member 32 (up-and-down width of face) It is smaller than the thickness of the fan module 1. In addition, notch 39 is formed in the perpendicular board of the channel form member 32, and it enables it to draw the code 8 of the fan module 1 in the channel form member 32.

[0034] A steel plate and copper alloy board, The band metallic ornaments 40 by which board thickness, such as a stainless steel plate, consists of a thin metal plate are the fan module 1 top and the bottom flange 6-1, and 6-2. It is mostly bent and formed in the typeface of KO by plane view, and the edge of right and left by the side of opening is bent right-angled outside, respectively, and the taking-a-seat section 41 is provided so that the fuselage section 9 of a between may be supported from under.

[0035] The hole 42 of each taking-a-seat section 41 which inserts the cervix of a screw thread 43 in a

core is punched mostly. 45 46 For example, rubber board, It is the elastic body board of the shape of a strip of paper which consists of felt etc.

[0036] The elastic body board 45 is stuck on the part which counters the fuselage section 9 inside the band metallic ornaments 40. Moreover, other elastic body boards 46 are the rear faces of the perpendicular plate of the channel form member 32, and are stuck on the part which counters the fuselage section 9 of the fan module 1 to attach.

[0037] (B) of drawing 1 As illustrated, the band metallic ornaments 40 are made engaged so that the fuselage section 9 of the fan module 1 may be supported from under, the rear face of the perpendicular plate of the channel form member 32 is contacted in the taking-a-seat section 41, and a screw thread 43 is inserted in the hole 42 of the taking-a-seat section 41, and the channel form member 32 ****s, it screws on a hole 33, and the fan module 1 is carried in the tie-down plate 30.

[0038] between the electronic units 52 carried in the rack 51 like the tie-down plate illustrated to drawing 3 multi-stage -- the channel form member 32 and the fan module 1 of a tie-down plate 30 of ***** -- inserting -- a bridging board -- the field by the side of the transverse plane of **** 55 of right and left of the rear face of a member 31 is contacted

[0039] and the bolt 56 -- using -- a bridging board -- the member 31 is fixed to the rack 51 Under the present circumstances, the width of face of the band metallic ornaments 40 which support the fuselage section 9 of the fan case 2 from under is smaller than the height of the fan case 2, and its height of the channel form member 32 of a tie-down plate 30 is also almost equal to the width of face of the band metallic ornaments 40.

[0040] Therefore, a fan module thick twist can also enlarge slightly the interval of the upper and lower sides of the electronic unit carried in a rack, and the height of electronic equipment becomes small. the bridging board of the long and slender tabular which constructs across the front face of a rack the tie-down plate 30 illustrated to drawing, contacts an edge on either side in the field by the side of the transverse plane of **** 55 on either side, and fixes using a bolt 56 -- a member 34 and a bridging board -- ***** close to the rear face of a member 34 consists of a channel form member 35 of the typeface of U

[0041] By fixing two or more band metallic ornaments 40 at the rear face of the perpendicular plate of the posterior part of the channel form member 35, two or more fan modules 1 are carried in the tie-down plate 30 in parallel. the perpendicular plate of the near side of the channel form member 35 -- a bridging board -- a member 34 -- being close -- in piles -- a bridging board -- it is made to fix a member 34 and the channel form member 35 to a rack simultaneously

[0042] thus, a bridging board -- even if the tie-down plate 30 of the structure which piled up the member 34 and the channel form member 35 has composition and carries two or more fan modules 1, it does not have a possibility that the center section of the tie-down plate 30 may bend

[0043] Moreover, there is an advantage that the fan module 1 can be carried in the optimal position in a rack 51 by forming the channel form member 35 from which the length of a cross direction differs.

[0044]

[Effect of the Invention] Since it is constituted as explained above, the fan unit of this invention has the following effects.

[0045] The interval of the upper and lower sides of the electronic unit carried in a rack can be slightly enlarged rather than the thickness of a fan module, and the height of electronic equipment becomes small. Moreover, vibration in which the fan unit which made the elastic body board intervene, respectively between the fuselage section of a fan module and band metallic ornaments and between the fuselage section and the channel section of a tie-down plate originates in rotation of the wing of a fan module is absorbed with an elastic body board, and generating of noise is prevented.

[0046] Moreover, the adhesion of a fan module and band metallic ornaments is secured by having made the elastic body board intervene.

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PRIOR ART

[Description of the Prior Art] The conventional fan unit is explained referring to drawing 4 . drawing 4 -- setting -- the axial flow type fan module 1 -- the center of the fan case 2 -- it consists of a motor 3 installed in the axial center of a hole, body of revolution of the closed-end cylindrical shape which separates and attaches a gap in the outside of a motor 3, and two or more wings 5 arranged in pitches [side / periphery / of body of revolution]

[0008] Therefore, if a motor 3 is driven, body of revolution will rotate, a wing 5 rotates in connection with it, and from the lower part of the fan module 1, air is inhaled and it discharges up. The fan case 2 is the upper flange 6-1 of the square shape which four angles were beveled and was formed in the fuselage section 9 and the upper part of the fuselage section 9. It consists of a lower flange 6-2 of the square shape formed in the lower part of the fuselage section 9.

[0009] Upper flange 6-1 Hole 7-1 which inserts the cervix of a screw thread 25 in four corners, respectively It has arranged. Moreover, lower flange 6-2 It is the upper flange 6-1 to four corners. Hole 7-1 It is a hole 7-2 face to face. It has prepared.

[0010] 20 is a tie-down plate which bent the metal plate to side **** L form and which consists of perpendicular Itabe material 21 and level Itabe material 22. The perpendicular Itabe material 21 is a member which contacts and fixes an edge on either side using a bolt 56 to the field by the side of the transverse plane of **** 55 of the right-and-left couple of a rack.

[0011] a horizontal plate -- a member 22 is equal to a predetermined part to attach the fan module 1 in in the bore size of the fuselage section 9 -- circular -- a hole -- having -- this -- circular -- the periphery section of a hole -- upper flange 6-1 Hole 7-1 Hole (four holes) which corresponds, ****s and inserts the cervix of 25 It has arranged.

[0012] Upper flange 6-1 Alignment of the upper surface is carried out to the inferior surface of tongue of the level Itabe material 22, it contacts, and the cervix of a screw thread 25 is the hole of the level Itabe material 22. Top flange 6-1 A hole 7-1 and lower flange 6-2 So that a hole 7-2 may be penetrated A screw thread 25 is inserted and it is the lower flange 6-2. By screwing a nut on the thread part which projected from the inferior surface of tongue, the fan module 1 is hung to the tie-down plate 20.

[0013] The fan module 1 is carried in a tie-down plate 20 as mentioned above, and the conventional fan unit is constituted.

[Translation done.]